

***What Is Claimed Is:***

1. An isolated polynucleotide comprising a nucleic acid sequence encoding an amino acid sequence identical to, except for up to five amino acid alterations per 100 amino acids, an amino acid sequence selected from the group consisting of:
  - (a) the full-length IspA amino acid sequence encoded by the ORF represented by SEQ ID NO:63; and
  - (b) the full-length IspA amino acid sequence represented by SEQ ID NO:64.
2. The isolated polynucleotide of claim 1 wherein the amino acid sequence is (a).
3. The isolated polynucleotide of claim 1 wherein the amino acid sequence is (b).
4. The isolated polynucleotide of claim 1, wherein said polynucleotide comprises a heterologous polynucleotide sequence.
5. The isolated polynucleotide of claim 4, wherein said heterologous polynucleotide sequence encodes a heterologous polypeptide.
6. A method for making a recombinant vector comprising inserting the isolated polynucleotide of claim 1 into a vector.
7. A recombinant vector comprising the isolated polynucleotide of claim 1.
8. The recombinant vector of claim 7, wherein said polynucleotide is operably associated with a heterologous regulatory sequence that controls gene expression.
9. A recombinant host cell comprising the isolated polynucleotide of claim 1.
10. The recombinant host cell of claim 9, wherein said polynucleotide is operably associated with a heterologous regulatory sequence that controls gene expression.

11. A method for producing a polypeptide, comprising:  
(a) culturing a cell under conditions suitable to produce a polypeptide encoded by the polynucleotide of claim 1; and  
(b) recovering the polypeptide.
12. A polypeptide produced by the method of claim 11.
13. An isolated polynucleotide comprising a nucleic acid sequence encoding an epitope-bearing portion of an amino acid sequence selected from the group consisting of:  
(a) the full-length IspA amino acid sequence encoded by the ORF represented by SEQ ID NO:63; and  
(b) the full-length IspA amino acid sequence represented by SEQ ID NO:64.
14. The isolated polynucleotide of claim 13 wherein the amino acid sequence is (a).
15. The isolated polynucleotide of claim 13 wherein the amino acid sequence is (b).
16. The isolated polynucleotide of claim 13, wherein said polynucleotide comprises a heterologous polynucleotide sequence.
17. The isolated polynucleotide of claim 16, wherein said heterologous polynucleotide sequence encodes a heterologous polypeptide.
18. A method for making a recombinant vector comprising inserting the isolated polynucleotide of claim 13 into a vector.
19. A recombinant vector comprising the isolated polynucleotide of claim 13.
20. The recombinant vector of claim 19, wherein said polynucleotide is operably associated with a heterologous regulatory sequence that controls gene expression.
21. A recombinant host cell comprising the isolated polynucleotide of claim 13.

22. The recombinant host cell of claim 21, wherein said polynucleotide is operably associated with a heterologous regulatory sequence that controls gene expression.

23. A method for producing a polypeptide, comprising:

(a) culturing a cell under conditions suitable to produce a polypeptide encoded by the polynucleotide of claim 13; and

(b) recovering the polypeptide.

24. A polypeptide produced by the method of claim 23.

25. An isolated polynucleotide comprising a nucleic acid sequence encoding a fragment of an amino acid sequence identical to, except for up to five amino acid alterations per 100 amino acids, a fragment of an amino acid sequence selected from the group consisting of selected from the group consisting of:

(a) the full-length IspA amino acid sequence encoded by the ORF represented by SEQ ID NO:63, wherein said fragment specifically binds an antibody which specifically binds a polypeptide consisting of the amino acid sequence of HGS072; and

(b) the full-length IspA amino acid sequence represented by SEQ ID NO:64, wherein said fragment specifically binds an antibody which specifically binds a polypeptide consisting of the amino acid sequence of HGS072.

26. The isolated polynucleotide of claim 25 wherein the amino acid sequence is (a).

27. The isolated polynucleotide of claim 25 wherein the amino acid sequence is (b).

28. The isolated polynucleotide of claim 25, wherein said polynucleotide comprises a heterologous polynucleotide sequence.

29. The isolated polynucleotide of claim 28, wherein said heterologous polynucleotide sequence encodes a heterologous polypeptide.

30. A method for making a recombinant vector comprising inserting the isolated polynucleotide of claim 25 into a vector.
31. A recombinant vector comprising the isolated polynucleotide of claim 25.
32. The recombinant vector of claim 31, wherein said polynucleotide is operably associated with a heterologous regulatory sequence that controls gene expression.
33. A recombinant host cell comprising the isolated polynucleotide of claim 25.
34. The recombinant host cell of claim 33, wherein said polynucleotide is operably associated with a heterologous regulatory sequence that controls gene expression.
35. A method for producing a polypeptide, comprising:
  - (a) culturing a cell under conditions suitable to produce a polypeptide encoded by the polynucleotide of claim 25; and
  - (b) recovering the polypeptide.
36. A polypeptide produced by the method of claim 35.
37. An isolated polynucleotide comprising a nucleic acid sequence encoding at least 15 contiguous amino acid residues of an amino acid sequence selected from the group consisting of:
  - (a) the full-length IspA amino acid sequence encoded by the ORF represented by SEQ ID NO:63; and
  - (b) the full-length IspA amino acid sequence represented by SEQ ID NO:64.
38. The isolated polynucleotide of claim 37 wherein the amino acid sequence is (a).
39. The isolated polynucleotide of claim 37 wherein the amino acid sequence is (b).

40. The isolated polynucleotide of claim 37, wherein said polynucleotide comprises a heterologous polynucleotide sequence.

41. The isolated polynucleotide of claim 40, wherein said heterologous polynucleotide sequence encodes a heterologous polypeptide.

42. A method for making a recombinant vector comprising inserting the isolated polynucleotide of claim 37 into a vector.

43. A recombinant vector comprising the isolated polynucleotide of claim 37.

44. The recombinant vector of claim 43, wherein said polynucleotide is operably associated with a heterologous regulatory sequence that controls gene expression.

45. A recombinant host cell comprising the isolated polynucleotide of claim 37.

46. The recombinant host cell of claim 45, wherein said polynucleotide is operably associated with a heterologous regulatory sequence that controls gene expression.

47. A method for producing a polypeptide, comprising:

(a) culturing a cell under conditions suitable to produce a polypeptide encoded by the polynucleotide of claim 37; and

(b) recovering the polypeptide.

48. A polypeptide produced by the method of claim 47.

49. The isolated polynucleotide of claim 37, wherein said polynucleotide comprises a nucleic acid sequence encoding at least 30 contiguous amino acid residues of an amino acid sequence selected from the group consisting of:

(a) the full-length IspA amino acid sequence encoded by the ORF represented by SEQ ID NO:63; and

(b) the full-length IspA amino acid sequence represented by SEQ ID NO:64.

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50. The isolated polynucleotide of claim 49 wherein the amino acid sequence is (a).
51. The isolated polynucleotide of claim 49 wherein the amino acid sequence is (b).
52. The isolated polynucleotide of claim 49, wherein said polynucleotide comprises a heterologous polynucleotide sequence.
53. The isolated polynucleotide of claim 52, wherein said heterologous polynucleotide sequence encodes a heterologous polypeptide.
54. A method for making a recombinant vector comprising inserting the isolated polynucleotide of claim 49 into a vector.
55. A recombinant vector comprising the isolated polynucleotide of claim 49.
56. The recombinant vector of claim 55, wherein said polynucleotide is operably associated with a heterologous regulatory sequence that controls gene expression.
57. A recombinant host cell comprising the isolated polynucleotide of claim 49.
58. The recombinant host cell of claim 57, wherein said polynucleotide is operably associated with a heterologous regulatory sequence that controls gene expression.
59. A method for producing a polypeptide, comprising:
  - (a) culturing a cell under conditions suitable to produce a polypeptide encoded by the polynucleotide of claim 49; and
  - (b) recovering the polypeptide.
60. A polypeptide produced by the method of claim 59.
61. An isolated polynucleotide comprising a nucleic acid sequence which hybridizes,

at 42°C in 50% formamide, 5x SSC (750 mM NaCl, 75 mM trisodium citrate), 50 mM sodium phosphate (pH 7.6), 5x Denhardt's solution, 10% dextran sulfate, and 20 µg/ml denatured, sheared salmon sperm DNA, followed by washing in 0.1x SSC at 65°C, to a nucleic acid sequence complementary to a portion of an ORF encoding an amino acid sequence selected from the group consisting of:

(a) the full-length IspA amino acid sequence encoded by the ORF represented by SEQ ID NO:63; and

(b) the full-length IspA amino acid sequence represented by SEQ ID NO:64.

62. The isolated polynucleotide of claim 61 wherein the amino acid sequence is (a).

63. The isolated polynucleotide of claim 61 wherein the amino acid sequence is (b).

64. The isolated polynucleotide of claim 61, wherein said polynucleotide comprises a heterologous polynucleotide sequence.

65. The isolated polynucleotide of claim 64, wherein said heterologous polynucleotide sequence encodes a heterologous polypeptide.

66. A method for making a recombinant vector comprising inserting the isolated polynucleotide of claim 61 into a vector.

67. A recombinant vector comprising the isolated polynucleotide of claim 61.

68. The recombinant vector of claim 67, wherein said polynucleotide is operably associated with a heterologous regulatory sequence that controls gene expression.

69. A recombinant host cell comprising the isolated polynucleotide of claim 61.

70. The recombinant host cell of claim 69, wherein said polynucleotide is operably associated with a heterologous regulatory sequence that controls gene expression.

71. A method for producing a polypeptide, comprising:  
(a) culturing a cell under conditions suitable to produce a polypeptide encoded by the polynucleotide of claim 61; and  
(b) recovering the polypeptide.
72. A polypeptide produced by the method of claim 71.
73. An isolated polynucleotide comprising at least 50 contiguous nucleotides, or the complement thereof, of an ORF encoding an amino acid sequence selected from the group consisting of:  
(a) the full-length IspA amino acid sequence encoded by the ORF represented by SEQ ID NO:63; and  
(b) the full-length IspA amino acid sequence represented by SEQ ID NO:64.
74. The isolated polynucleotide of claim 73 wherein the amino acid sequence is (a).
75. The isolated polynucleotide of claim 73 wherein the amino acid sequence is (b).
76. The isolated polynucleotide of claim 73, wherein said polynucleotide comprises a heterologous polynucleotide sequence.
77. The isolated polynucleotide of claim 76, wherein said heterologous polynucleotide sequence encodes a heterologous polypeptide.
78. A method for making a recombinant vector comprising inserting the isolated polynucleotide of claim 73 into a vector.
79. A recombinant vector comprising the isolated polynucleotide of claim 73.
80. The recombinant vector of claim 79, wherein said polynucleotide is operably associated with a heterologous regulatory sequence that controls gene expression.



81. A recombinant host cell comprising the isolated polynucleotide of claim 73.
82. The recombinant host cell of claim 81, wherein said polynucleotide is operably associated with a heterologous regulatory sequence that controls gene expression.
83. A method for producing a polypeptide, comprising:  
(a) culturing a cell under conditions suitable to produce a polypeptide encoded by the polynucleotide of claim 73; and  
(b) recovering the polypeptide.
84. A polypeptide produced by the method of claim 83.
85. (New) The isolated polynucleotide of claim 73 comprising at least 100 contiguous nucleotides of an ORF encoding an amino acid sequence selected from the group consisting of:  
(a) the full-length IspA amino acid sequence encoded by the ORF represented by SEQ ID NO:63; and  
(b) the full-length IspA amino acid sequence represented by SEQ ID NO:64.
86. The isolated polynucleotide of claim 85 wherein the amino acid sequence is (a).
87. The isolated polynucleotide of claim 85 wherein the amino acid sequence is (b).
88. The isolated polynucleotide of claim 85, wherein said polynucleotide comprises a heterologous polynucleotide sequence.
89. The isolated polynucleotide of claim 88, wherein said heterologous polynucleotide sequence encodes a heterologous polypeptide.
90. A method for making a recombinant vector comprising inserting the isolated polynucleotide of claim 85 into a vector.

91. A recombinant vector comprising the isolated polynucleotide of claim 85.
92. The recombinant vector of claim 91, wherein said polynucleotide is operably associated with a heterologous regulatory sequence that controls gene expression.
93. A recombinant host cell comprising the isolated polynucleotide of claim 85.
94. The recombinant host cell of claim 93, wherein said polynucleotide is operably associated with a heterologous regulatory sequence that controls gene expression.
95. A method for producing a polypeptide, comprising:  
    (a) culturing a cell under conditions suitable to produce a polypeptide encoded by the polynucleotide of claim 85; and  
    (b) recovering the polypeptide.
96. A polypeptide produced by the method of claim 95.